



請依題號作答並將答案寫在答案卷上，違者不予計分。

Part I. Microeconomics: 50% (each question 2.5 points), choose the best answer.

1. If you could exactly afford either 4 units of x and 27 units of y , or 9 units of x and 7 units of y , then if you spent all of your income on y , how many units of y could you buy?
 - A) 23.
 - B) 63.
 - C) 43.
 - D) 13.
2. John's indifference curves have the equation $x_B = \text{constant}/x_A$, where larger constants correspond to better indifference curves. John strictly prefers the bundle (6,15) to the bundle
 - A) (15,6).
 - B) (7,14).
 - C) (11,13).
 - D) (11,8).
3. Mary has the utility function $U(x_1, x_2) = \min\{x_1 + 2x_2, 2x_1 + x_2\}$, where x_1 : the number of corn chips, x_2 : the number of French fries. She has \$40 to spend on corn chips and French fries. If the price of corn chips is \$2 per unit and the price of French fries is \$2 per unit, then Mary will
 - A) Consume at least as many as corn chips as French fries but might consume both.
 - B) Definitely spend all of her income on corn chips.
 - C) Definitely spend all of her income on French fries.
 - D) Consume equal amounts of French fries and corn chips.
4. Charlie's utility function is $U(x_A, x_B) = x_A x_B$. If Charlie's income were \$40, the price of x_A were \$2 and the price of x_B were \$5, how many x_A would there be in the best bundle that Charlie could afford?
 - A) 20.
 - B) 10.
 - C) 6.
 - D) 5.



5. Elmer's utility function is $U(x,y)=\min\{x,y^2\}$. If the price of x is \$15, the price of y is \$30, and Elmer chooses to consume 2 units of y , what must Elmer's income be?
- A) \$1350.
B) \$175.
C) \$120.
D) \$675.
6. Francis has an income of \$60 and a utility function $U(x,y)=20x^{1/2}+y$. The price of x is \$5 and the price of y is \$1. How many units of y will Francis demand?
- A) 10.
B) 80.
C) 4.
D) 40.
7. If the interest rate is 15% and will remain 15% forever, how much would a rational investor be willing to pay for an asset that will pay him 3450 dollars 1 year from now, 1322 dollars 2 years from now, and nothing at any other time?
- A) \$4000.
B) \$26666.67.
C) \$64000.
D) \$3000.
8. Suppose Peter can make up his portfolio using a risk-free asset that offers a rate of return of 10% and a risky asset with an expected rate of return of 20% and with standard deviation 5. If he chooses a portfolio with an expected rate of 20%, then the standard deviation of his return on this portfolio will be
- A) 2.5%.
B) 8%.
C) 5%.
D) 10%.
9. Alice has a demand function for mead that is given by the equation $D(p)=100-p$. If the price of mead is \$85, how much is Alice's net consumer's surplus?
- A) 112.5.
B) 15.
C) 225.
D) 200.



10. The demand function for apples is given by $D(p)=(p+1)^2$. If the price of apples is \$4, then the price elasticity of demand is
- A) -1.50.
 - B) -1.16.
 - C) -0.32.
 - D) -4.80.
11. The inverse demand function for bananas is defined by the equation $p=136-4q$, where q is the number of units sold. The inverse supply function is defined by $p=16+4q$. A tax of \$16 is imposed on suppliers for each unit of bananas that they sell. When the tax is imposed, the quantity of bananas sold falls to
- A) 13.
 - B) 11.
 - C) 15.
 - D) 16.
12. Bob applies N pounds of fertilizer per acre, the marginal product of fertilizer is $1-(N/200)$ bushels of corn. If the price of corn is \$1 per bushel and the price of fertilizer is \$0.40 per pound, then how many pounds of fertilizer per acre should Bob use in order to maximize his profits?
- A) 64.
 - B) 120.
 - C) 240.
 - D) 200.
13. Nadine has a production function $5x+y$. If the price of x is \$10 and the price of y is \$3, how much will it cost her to produce 70 units of output?
- A) \$1960.
 - B) \$3170.
 - C) \$140.
 - D) \$210.
14. If Mr. Dent Carr's total costs of repairing s cars is $4s^2+40s+20$, then if he repairs 10 cars, his average variable costs will be
- A) \$120.
 - B) \$82.
 - C) \$160.
 - D) \$80.



15. If Mr. Dent Carr's long run total costs of repairing s cars per week is $3s^2+108$. If the price he receives for repairing a car is \$24, then in the long run, how many cars will he fix if he maximizes profits?
- A) 0.
B) 4.
C) 8.
D) 12.
16. A profit-maximizing monopoly faces an inverse demand function described by the equation $p(y)=60-y$ and his total costs are $c(y)=10y$. In the past it was not taxed, but now it must pay a tax of \$4 per unit of output. After the tax, the monopoly will
- A) Increase its price by \$4.
B) Leave its price constant.
C) Increase its price by \$2.
D) Increase its price by \$8.
17. Goods A has the demand $Q_1=18000-900p_1$ in the United States and the demand $Q_2=2000-200p_2$ in England, then the difference between the price charged in the United States and the price charged in England will be.
- A.) \$10.
B.) \$0.
C.) \$11.
D.) \$5.
18. Which of the following statements about game theory is true?
- A) A situation where everyone is playing a dominant strategy must be a Nash equilibrium.
B) In the prisoner's dilemma game, if each prisoner believed that the other prisoner would deny the crime, then both would deny the crime.
C) A two-person game in which each person has access to only two possible strategies will have at most one Nash equilibrium.
D) If a game does not have equilibrium in pure strategies, then it will not have equilibrium in mixed strategies either.



19. The following relationship must hold between the average total cost (ATC) curve and the marginal cost curve (MC):
- A) If MC is rising, ATC must be rising.
 - B) If MC is rising, ATC must be greater than MC.
 - C) If MC is rising, ATC must be less than MC.
 - D) If ATC is rising, MC must be greater than ATC.
20. A firm has the long run cost function $C(q)=3q^2+27$. In the long run, it will supply a positive amount of output, so long as the price is greater than
- A) \$36.
 - B) \$44.
 - C) \$9.
 - D) \$18.



Part II、Macroeconomics(50%)

1. 有二組資料如下表:

I 組	所得	II 組	所得
A	100	a	200
B	700	b	250
C	750	c	300
D	800	d	700
E	850	e	800

- (1) 請算出以上二組資料的吉尼係數(5%)
 - (2) 請畫出二條羅倫茲曲線(5%)
 - (3) 那一組所得分配較平均？為什麼？(5%)
2. 請利用總供需的架構說明新興古典學派、新興凱因斯學派、與實質景氣循環理論不同的觀點。(10%)
 3. 試述當期可支配所得、預期可支配所得、以及利率如何影響家戶的消費與儲蓄？(10%)
 4. 設某封閉經濟體系，消費 $C=100+0.75(Y-T)$ ，投資 $I=200-40i$ ，政府支出 $G=400$ ，稅收 $T=100$ 。並且，實質貨幣需求 $L(i, Y)=500+0.4Y-100i$ ，名目貨幣供給量為 600 億元， i 的單位為%， Y 的單位為億元。請找出總需求曲線方程式，並畫出其圖形。(8%)
 5. 設以 IS-LM 架構說明何謂投資陷阱？何謂流動性陷阱？(7%)



請依題號作答並將答案寫在答案卷上，違者不予計分。

1. 試找出位於拋物線 $y^2 = 2x$ 上，且最接近點 $(1, 4)$ 的點座標。 (10分)
2. 一個金字塔，其正方形的底邊長為 L ，金字塔的高度為 h 時，試求其體積。 (10分)
3. 試找出函數 $y = \frac{x^2 + 2x + 4}{2x}$ 的所有漸近線。 (10分)
4. 試找出無窮級數 $\sum_{n=1}^{\infty} (-1)^n \frac{(x+2)^n}{n \cdot 2^n}$ 的收斂半徑及收斂區間。 (10分)
5. 試找出 $f(x, y) = x^4 + y^4 - 4xy + 1$ 的極值及鞍點座標。 (10分)
6. 試證明方程式 $x^{11} + x^5 - 1 = 0$ 只有一個正實數解，且是唯一的解。 (10分)
7. 給定一函數為 $y = \sqrt{x - x^2} - \sin^{-1} \sqrt{x}$ ，試計算該函數的全部弧長。 (10分)
8. 令 $f(x, y) = \begin{cases} \frac{xy}{x^4 + y^2}, & \text{當 } (x, y) \neq (0, 0); \\ 0, & \text{當 } (x, y) = (0, 0). \end{cases}$
試證明 $f_x(0, 0)$ 和 $f_y(0, 0)$ 皆存在，但 f 在 $(0, 0)$ 並不連續。 (10分)
9. 設 $U(x, y) = x^\beta y^{1-\beta}$ ， $0 < \beta < 1$ ， $x, y \geq 0$ 。試求在 $px + y = W_0$ 的限制下，
其中， $p > 0$ ， $W_0 > 0$ ，使 U 達到極大值的 x, y 分別是多少，以及此時的
極大值。 (10分)
10. 試計算重積分 $\iint_S 2x \, dA$ ，其中， S 是由 $y = x^2$ ， $y = 1$ ， $x + y = 6$ 三條線
所圍成的區域。 (10分)



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本試題共有五大題，每大題分數各為 20 分。

- 一、總統大選雖已落幕，可是政壇依然紛擾，民心浮動不止，影響股市甚巨；有學者建議應關閉市場，或是降低每日漲跌幅，就『流動性』與『均衡價格』而言，您的看法如何？
- 二、中華開發金控經營權之爭，其精彩詭譎不下於總統大選，這充分顯示出台灣公開發行公司的『代理問題』與『治理機制』有很大的改善空間，就此二議題，您的看法如何？
- 三、又是一年一度上市上櫃公司發放股利(現金或股票)的時節，請問股利發放的多寡，與以下四個變數呈現什麼樣的相關(正、負或零)？(a)獲利(b)市價淨值比(c)公司規模(d)負債程度。
- 四、第二次世界大戰後，美元(US dollar)一直是國際外匯市場的強勢貨幣。最近幾個月，美元在世界各外匯市場皆呈現貶值之勢，試問：
 - (a)從美國觀點，分析最近美元貶值的原因。 6%
 - (b)對臺灣而言，最近美元貶值對臺灣的景氣復甦與股票市場會有何影響？ 8%
 - (c)如果你(妳)是臺灣一家證券商的分析師，面對最近美元貶值之勢，你(妳)的國際投資策略建議為何？ 6%
- 五、臺灣最近陸續成立 14 家金融控股公司，假設你(妳)是某家金融控股公司中的銀行總經理，試回答下列問題：
 - (a)就經營獲利而言，金控架構下的銀行比非金控下的銀行有何優勢？ 10%
 - (b)就風險管理觀點，金控架構下的銀行比非金控下的銀行有何特殊不一樣之處？ 10%



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The test consists of 10 fill-in-blank questions.

1. Given the joint p.d.f. $f(x, y) = 6(1 - x - y)$ for $0 < y < 1 - x$ and $x > 0$.
Find $f(y|x)$. _____ . (10 points)

2. Find the variance for the continuous variable Y with p.d.f.

(a) $f(y) = \frac{1}{2}e^{-|y|}$. _____ . (5 points)

(b) $f(y) = 6y(1 - y)$, $0 < y < 1$. _____ . (5 points)

3. Evaluate the following expressions:

$$\sum_{k=0}^{10} k \binom{10}{10-k} (0.5)^{10}. \text{ _____ . (10 points)}$$

4. A researcher wants to estimate the population within a 95% level of confidence. He estimates from previous studies that the population is no more than 0.30. The researcher wants the estimate to have an error of no more than 0.30. The necessary sample size is at least _____. (10 points)

5. The net profit of an investment is normally distributed with a mean of \$10,000 and a standard deviation of \$5,000. The probability that the investor's net gain will be at least \$5,000 is _____. (10 points)

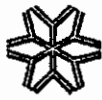
6. If X is a random variable with mean 100 and standard deviation 35, find a number c such that the probability that the random variable X deviates from mean in the c is at least 0.86. _____. (10 points)

7. Let $\{X_1, X_2, \dots, X_n\}$ be a random sample of size n drawn from a population with probability density function: $f(x|\theta) = \theta x \exp(-0.5\theta x^2)$, $0 < x$.

(a) Find the method of moment estimate of θ . _____. (4 points)

(b) Describe the distribution of $\sum_{i=1}^n X_i^2$. _____. (3 points)

(c) Find an unbiased estimate of θ . _____. (3 points)



8. 根據某些文章的報導,小廠商在景氣開始復甦時,似乎會比大公司雇用更多人。下表顯示一個隨機樣本共 1032 家廠商,按照廠商大小分類所雇用與解雇的員工人數。寫出你的虛無假設和結論。_____。(10 分)

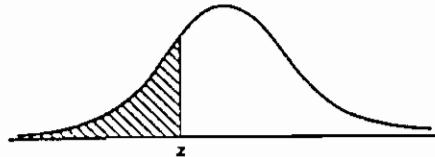
	小型廠商	中型廠商	大型廠商	合計
雇用人數	210	290	325	825
解雇人數	32	95	80	207
合計	242	385	405	1032

9. 某基金經理人宣稱其所管理的基金的年度報酬率為平均 30%的指數分配 (exponential distribution)。投資人想檢驗此一敘述是否為真,並蒐集了下列報酬率數據: 41.3%, 20.2%, 30.8%, 30.4%, 24.4%, 26.7%, 35.5%, 41.9%, 32.2%, 17.6%, 21.0%, 23.3%, 18.5%, 26.1%, 37.2%, 30.9%, 25.8%, 19.4%, 43.4%, 22.1%。試依據這樣的資料進行分析,寫出你的虛無假設和結論。_____。(10 分)
10. 當經濟水平為“高”時,某一經濟指標上揚的機率是 75%;當經濟水平為“中”等時,該經濟指標上揚的機率是 20%;當經濟水平為“低”時,該經濟指標上揚的機率為 5%。在任何時期中,高經濟水平的機率和低經濟水平的機率皆為 20%,而中等經濟水平的機率則為 60%。已知該指標剛剛上揚,試問高經濟水平的機率為何?_____。(10 分)



TABLE I Values of the Standard Normal Distribution Function

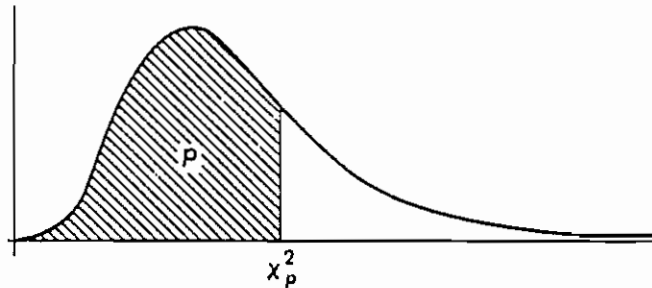
$$\Phi(z) = \int_{-\infty}^z \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}u^2\right) du = P(Z \leq z)$$



z	0	1	2	3	4	5	6	7	8	9
-3.	.0013	.0010	.0007	.0005	.0003	.0002	.0002	.0001	.0001	.0000
-2.9	.0019	.0018	.0017	.0017	.0016	.0016	.0015	.0015	.0014	.0014
-2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
-2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
-2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
-2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
-2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
-2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
-2.2	.0139	.0136	.0132	.0129	.0126	.0122	.0119	.0116	.0113	.0110
-2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
-2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
-1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0238	.0233
-1.8	.0359	.0352	.0344	.0336	.0329	.0322	.0314	.0307	.0300	.0294
-1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
-1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
-1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0570	.0559
-1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0722	.0708	.0694	.0681
-1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
-1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
-1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
-1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
-.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
-.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
-.7	.2420	.2389	.2358	.2327	.2297	.2266	.2236	.2206	.2177	.2148
-.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
-.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
-.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
-.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
-.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
-.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641



TABLE Vb Percentiles of the Chi-square Distribution



Degrees of freedom	$\chi^2_{.005}$	$\chi^2_{.01}$	$\chi^2_{.025}$	$\chi^2_{.05}$	$\chi^2_{.10}$	$\chi^2_{.20}$	$\chi^2_{.30}$	$\chi^2_{.50}$	$\chi^2_{.70}$	$\chi^2_{.80}$	$\chi^2_{.90}$	$\chi^2_{.95}$	$\chi^2_{.975}$	$\chi^2_{.99}$	$\chi^2_{.995}$
1	.000	.000	.001	.004	.016	.064	.148	.455	1.07	1.64	2.71	3.84	5.02	6.63	7.88
2	.010	.020	.051	.103	.211	.446	.713	1.39	2.41	3.22	4.61	5.99	7.38	9.21	10.6
3	.072	.115	.216	.352	.584	1.00	1.42	2.37	3.66	4.64	6.25	7.81	9.35	11.3	12.8
4	.207	.297	.484	.711	1.06	1.65	2.20	3.36	4.88	5.99	7.78	9.49	11.1	13.3	14.9
5	.412	.554	.831	1.15	1.61	2.34	3.00	4.35	6.06	7.29	9.24	11.1	12.8	15.1	16.7
6	.676	.872	1.24	1.64	2.20	3.07	3.83	5.35	7.23	8.56	10.6	12.6	14.4	16.8	18.5
7	.989	1.24	1.69	2.17	2.83	3.82	4.67	6.35	8.38	9.80	12.0	14.1	16.0	18.5	20.3
8	1.34	1.65	2.18	2.73	3.49	4.59	5.53	7.34	9.52	11.0	13.4	15.5	17.5	20.1	22.0
9	1.73	2.09	2.70	3.33	4.17	5.38	6.39	8.34	10.7	12.2	14.7	16.9	19.0	21.7	23.6
10	2.16	2.56	3.25	3.94	4.87	6.18	7.27	9.34	11.8	13.4	16.0	18.3	20.5	23.2	25.2
11	2.60	3.05	3.82	4.57	5.58	6.99	8.15	10.3	12.9	14.6	17.3	19.7	21.9	24.7	26.8
12	3.07	3.57	4.40	5.23	6.30	7.81	9.03	11.3	14.0	15.8	18.5	21.0	23.3	26.2	28.3
13	3.57	4.11	5.01	5.89	7.04	8.63	9.93	12.3	15.1	17.0	19.8	22.4	24.7	27.7	29.8
14	4.07	4.66	5.63	6.57	7.79	9.47	10.8	13.3	16.2	18.2	21.1	23.7	26.1	29.1	31.3
15	4.60	5.23	6.26	7.26	8.55	10.3	11.7	14.3	17.3	19.3	22.3	25.0	27.5	30.6	32.8
16	5.14	5.81	6.91	7.96	9.31	11.2	12.6	15.3	18.4	20.5	23.5	26.3	28.8	32.0	34.3
17	5.70	6.41	7.56	8.67	10.1	12.0	13.5	16.3	19.5	21.6	24.8	27.6	30.2	33.4	35.7
18	6.26	7.01	8.23	9.39	10.9	12.9	14.4	17.3	20.6	22.8	26.0	28.9	31.5	34.8	37.2
19	6.83	7.63	8.91	10.1	11.7	13.7	15.4	18.3	21.7	23.9	27.2	30.1	32.9	36.2	38.6
20	7.43	8.26	9.59	10.9	12.4	14.6	16.3	19.3	22.8	25.0	28.4	31.4	34.2	37.6	40.0
21	8.03	8.90	10.3	11.6	13.2	15.4	17.2	20.3	23.9	26.2	29.6	32.7	35.5	38.9	41.4
22	8.64	9.54	11.0	12.3	14.0	16.3	18.1	21.3	24.9	27.3	30.8	33.9	36.8	40.3	42.8
23	9.26	10.2	11.7	13.1	14.8	17.2	19.0	22.3	26.0	28.4	32.0	35.2	38.1	41.6	44.2
24	9.89	10.9	12.4	13.8	15.7	18.1	19.9	23.3	27.1	29.6	33.2	36.4	39.4	43.0	45.6
25	10.5	11.5	13.1	14.6	16.5	18.9	20.9	24.3	28.2	30.7	34.4	37.7	40.6	44.3	46.9
26	11.2	12.2	13.8	15.4	17.3	19.8	21.8	25.3	29.2	31.8	35.6	38.9	41.9	45.6	48.3
27	11.8	12.9	14.6	16.2	18.1	20.7	22.7	26.3	30.3	32.9	36.7	40.1	43.2	47.0	49.6
28	12.5	13.6	15.3	16.9	18.9	21.6	23.6	27.3	31.4	34.0	37.9	41.3	44.5	48.3	51.0
29	13.1	14.3	16.0	17.7	19.8	22.5	24.6	28.3	32.5	35.1	39.1	42.6	45.7	49.6	52.3
30	13.8	15.0	16.8	18.5	20.6	23.4	25.5	29.3	33.5	36.2	40.3	43.8	47.0	50.9	53.7
40	20.7	22.1	24.4	26.5	29.0	32.3	34.9	39.3	44.2	47.3	51.8	55.8	59.3	63.7	66.8
50	28.0	29.7	32.3	34.8	37.7	41.3	44.3	49.3	54.7	58.2	63.2	67.5	71.4	76.2	79.5
60	35.5	37.5	40.5	43.2	46.5	50.6	53.8	59.3	65.2	69.0	74.4	79.1	83.3	88.4	92.0

Note: For degrees of freedom $k > 30$, use $\chi_p^2 = \frac{1}{2}(z_p + \sqrt{2k-1})^2$, where z_p is the corresponding percentile of the standard normal distribution.

This table is adapted from Table VIII of *Biometrika Tables for Statisticians*, Vol. 1, 1954, by E. S. Pearson and H. O. Hartley, originally prepared by Catherine M. Thompson, with the kind permission of the editor of *Biometrika*.